NRR-DMPSPEm Resource

From: Wong, Albert
Sent: Wednesday, February 07, 2018 1:20 PM
To: wmagui1@entergy.com
Cc: RidsNrrDmlr Resource; RidsNrrDmlrMrpb Resource; RidsNrrPMRiverBend Resource; RidsOgcMailCenter Resource; Wilson, George; Donoghue, Joseph; Sayoc, Emmanuel; Wong, Albert; Allik, Brian; Gavula, James; Gardner, William; Oesterle, Eric; Alley, David; Martinez Navedo, Tania; Bailey, Stewart; Wittick, Brian; Ruffin, Steve; Bloom, Steven; Regner, Lisa; Turk, Sherwin; Sowa, Jeffrey; Parks, Brian; Pick, Greg; Kozal, Jason; Young, Cale; Young, Matt; Werner, Greg; McIntyre, David; Dricks, Victor; Moreno, Angel; Burnell, Scott; 'Broussard, Thomas Ray'; Lach, David J; SCHENK, TIMOTHY A; 'Coates, Alyson'
Subject: FYI_River Bend Station RAIs Set 9
Attachments: RBS Set 9 RAIs Enclosure - CLEAN Final_14 RAIs_020618.pdf; RBS RAIs Set 9 email ATTACHMENT 1 CLEAN_14 RAIs_4.3.1-1 removed_020618.pdf

Docket No. 50-458

Dear Mr. Maguire:

By letter dated May 25, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17153A282), Entergy Operations, Inc. (the applicant) submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants,” to renew the operating license NPF-47 for River Bend Station.

On January 16 and 19, 2018, the U.S Nuclear Regulatory Commission (NRC) staff sent Entergy Operations, Inc. the draft Requests for Additional Information (RAIs) for various technical review packages (TRP). Entergy Operations, Inc. subsequently informed the NRC staff that clarification calls were needed to discuss the information requested in all TRPs. The specific dates of the RAIs clarification calls and the actions taken are summarized in Attachment 1. The final RAIs are enclosed.

David Lach of your staff agreed to provide a response to all the final RAIs within 30 days of the date of this email. The NRC staff will be placing a copy of this email in the NRC’s Agencywide Documents Access and Management System.

Sincerely,

Emmanuel Sayoc, Project Manager - *Albert Wong for*
License Renewal Projects Branch (MRPB)
Division of Materials and License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosure:
As stated

OFFICE	PM:MRPB:DMLR	BC: MRPB:DMLR	PM: MRPB:DMLR
NAME	ESayoc	EOesterle	ESayoc *Albert Wong for*
DATE	01/31/2018	02/01/2018	02/07/2018

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Hearing Identifier: NRR_DMPS
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Subject: FYI_River Bend Station RAIs Set 9
Sent Date: 2/7/2018 1:20:02 PM
Received Date: 2/7/2018 1:20:00 PM
From: Wong, Albert

Created By: Albert.Wong@nrc.gov

Recipients:
"RidsNrrDmlr Resource" <RidsNrrDmlr.Resource@nrc.gov>
Tracking Status: None
"RidsNrrDmlrMrpb Resource" <RidsNrrDmlrMrpb.Resource@nrc.gov>
Tracking Status: None
"RidsNrrPMRiverBend Resource" <RidsNrrPMRiverBend.Resource@nrc.gov>
Tracking Status: None
"RidsOgcMailCenter Resource" <RidsOgcMailCenter.Resource@nrc.gov>
Tracking Status: None
"Wilson, George" <George.Wilson@nrc.gov>
Tracking Status: None
"Donoghue, Joseph" <Joseph.Donoghue@nrc.gov>
Tracking Status: None
"Sayoc, Emmanuel" <Emmanuel.Sayoc@nrc.gov>
Tracking Status: None
"Wong, Albert" <Albert.Wong@nrc.gov>
Tracking Status: None
"Allik, Brian" <Brian.Allik@nrc.gov>
Tracking Status: None
"Gavula, James" <James.Gavula@nrc.gov>
Tracking Status: None
"Gardner, William" <William.Gardner@nrc.gov>
Tracking Status: None
"Oesterle, Eric" <Eric.Oesterle@nrc.gov>
Tracking Status: None
"Alley, David" <David.Alley@nrc.gov>
Tracking Status: None
"Martinez Navedo, Tania" <Tania.MartinezNavedo@nrc.gov>
Tracking Status: None
"Bailey, Stewart" <Stewart.Bailey@nrc.gov>
Tracking Status: None
"Wittick, Brian" <Brian.Wittick@nrc.gov>
Tracking Status: None
"Ruffin, Steve" <Steve.Ruffin@nrc.gov>
Tracking Status: None
"Bloom, Steven" <Steven.Bloom@nrc.gov>
Tracking Status: None
"Regner, Lisa" <Lisa.Regner@nrc.gov>
Tracking Status: None
"Turk, Sherwin" <Sherwin.Turk@nrc.gov>
Tracking Status: None
"Sowa, Jeffrey" <Jeffrey.Sowa@nrc.gov>

Tracking Status: None
"Parks, Brian" <Brian.Parks@nrc.gov>
Tracking Status: None
"Pick, Greg" <Greg.Pick@nrc.gov>
Tracking Status: None
"Kozal, Jason" <Jason.Kozal@nrc.gov>
Tracking Status: None
"Young, Cale" <Cale.Young@nrc.gov>
Tracking Status: None
"Young, Matt" <Matt.Young@nrc.gov>
Tracking Status: None
"Werner, Greg" <Greg.Werner@nrc.gov>
Tracking Status: None
"McIntyre, David" <David.McIntyre@nrc.gov>
Tracking Status: None
"Dricks, Victor" <Victor.Dricks@nrc.gov>
Tracking Status: None
"Moreno, Angel" <Angel.Moreno@nrc.gov>
Tracking Status: None
"Burnell, Scott" <Scott.Burnell@nrc.gov>
Tracking Status: None
"'Broussard, Thomas Ray'" <tbrous1@entergy.com>
Tracking Status: None
"Lach, David J" <DLach@entergy.com>
Tracking Status: None
"SCHENK, TIMOTHY A" <TSCHENK@entergy.com>
Tracking Status: None
"'Coates, Alyson'" <alacey@entergy.com>
Tracking Status: None
"wmagui1@entergy.com" <wmagui1@entergy.com>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	1594	2/7/2018 1:20:00 PM
RBS Set 9 RAIs Enclosure - CLEAN Final_14 RAIs_020618.pdf	187290	
RBS RAIs Set 9 email ATTACHMENT 1 CLEAN_14 RAIs_4.3.1-1 removed_020618.pdf	115785	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

REQUEST FOR ADDITIONAL INFORMATION
LICENSE RENEWAL APPLICATION
RIVER BEND STATION, UNIT 1
DOCKET NO.: 50-458
CAC NO.: MF9757
Office of Nuclear Reactor Regulation
Division of Materials and License Renewal

10 CFR § 54.21(a)(3) of 10 CFR requires an applicant to demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation. One of the findings that the staff must make to issue a renewed license (10 CFR § 54.29(a)) is that actions have been identified and have been or will be taken with respect to the managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under § 54.21, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis (CLB). As described in SRP LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report. In order to complete its review and enable making a finding under 10 CFR § 54.29(a), the staff requires additional information in regard to the matters described below.

RAI B.1.17-1 (External Surfaces Monitoring)

Background

During its on-site audit, the staff walked down portions of the diesel generator building and noted that the air intake plenums, under normal operating conditions, draw outside air directly into the diesel generator rooms, without any conditioning of the ambient air. This is also represented on LRA Drawing PID-22-07A, "HVAC Diesel Generators."

LRA Table 3.0-1, "Service Environments for Mechanical Aging Management Reviews," states that the River Bend environment of "air-indoor" corresponds to "air-indoor uncontrolled" in the GALL Report. GALL Report Section IX.D, "Environments," defines "air-indoor uncontrolled" as an environment with temperatures higher than dew point (i.e., condensation can occur, but only rarely) and "air –outdoor" as an environment consisting of moist, possibly salt-laden atmospheric air, ambient temperatures and humidity, and exposure to weather, including precipitation.

NRC Standard Review Plan for License Renewal Applications (SRP-LR), Sections 3.2.2.2.3.2, 3.2.2.2.6, 3.3.2.2.3, 3.3.2.2.5, 3.4.2.2.2, and 3.4.2.2.3 discuss the possibility of aging effects extending to stainless steel components exposed to air "which has recently been introduced into buildings (i.e., components near intake vents)." The corresponding LRA sections state that there are no indoor stainless steel components located near unducted air intakes in engineered safety features, auxiliary, or steam and power conversion systems.

Issue

For in-scope components in the diesel generator building (e.g., items in LRA Tables 3.3.2-10, "Standby Diesel Generator," 3.3.2-11, "HPCS Diesel Generator," 3.3.2-18-12, "Standby Diesel

Generator System Nonsafety-Related Components Affecting Safety-Related Systems," 3.3.2-18-13, "HPCS Diesel Generator System Nonsafety-Related Components Affecting Safety-Related Systems," 3.3.2-17, "Fuel Oil System"), it is unclear to the staff why the air environment in this building is considered "air-indoor" given that, under normal operating conditions, outdoor air is drawn directly into the diesel generator rooms. Other than being protected from exposure to weather, components in these systems appear to be exposed to an environment where condensation from humid air can occur relatively frequently, contaminants from cooling tower treatment chemicals may be present, and chlorides from atmospheric air may be present. The staff notes that some materials exposed to air-indoor will have no aging effects requiring management whereas these materials will have aging effects requiring management (e.g., loss of material for stainless steel, aluminum; cracking for stainless steel) for exposure to air which has recently been introduced into buildings.

In addition, based on the staff's walkdown of the diesel generator building during its onsite audit, it is unclear to the staff how the applicant determined that the indoor stainless steel components are not located near unducted air intakes as stated in LRA Sections 3.2.2.2.3.2, 3.2.2.2.6, 3.3.2.2.3, 3.3.2.2.5, 3.4.2.2.2, and 3.4.2.2.3. It is also unclear to the staff if there are ducted air intakes which could result in stainless steel components located inside buildings being exposed to outdoor air.

Request

1. Provide information that establishes the "air-indoor" environment cited for components inside the diesel generator building for the LRA tables discussed above. Include information that addresses normal operating conditions, where outdoor air is drawn directly into the diesel generator rooms and its impact on whether condensation occurs on components more than rarely, as described in the corresponding definition of the GALL Report.
2. In light of the staff's observation during its walkdown of the diesel generator building, provide information that establishes there are no indoor stainless steel components located near ducted or unducted air intakes in engineered safety features, auxiliary, or steam and power conversion systems. Include information that addresses the associated sections of SRP-LR regarding components exposed to air that has been recently introduced into buildings.

RAI B.1.17-2 (External Surfaces Monitoring)

Background

GALL Report AMP XI.M36, "External Surfaces Monitoring of Mechanical Components," recommends inspections for leakage to identify cracking of stainless steel external surfaces exposed to air environments containing halides.

LRA Section B.1.17 states that inspection parameters include leakage for detection of cracks on the external surfaces of stainless steel components exposed to an air environment containing halides. LRA Tables 3.3.2-10, 3.3.2-11, and 3.3.2-12, "Control Building HVAC System," contain AMR items for stainless steel components exposed to an outdoor air external environment and an exhaust gas or outdoor air internal environment. Cracking is managed for these components with the External Surfaces Monitoring program.

Issue

For stainless steel components that have an internal environment of exhaust gas or outdoor air, it is not clear to the staff how inspections of external surfaces will effectively use leakage as an indicator of cracking.

Request

Provide information regarding the inspection parameters and the inspection methods that will be used to determine whether cracking is present in the stainless steel components exposed to outdoor air in LRA Tables 3.3.2-10, 3.3.2-11, and 3.3.2-12 with an exhaust gas or outdoor air internal environment.

RAI B.1.17-3 (External Surfaces Monitoring)

Background

In support of its integrated plant assessment, River Bend Station (RBS) prepared report RBS-EP-15-00007, Revision 0, "Aging Management Program Evaluation Results – Non-Class 1 Mechanical," to demonstrate that the programs credited in the license renewal aging management review reports are adequate to support license renewal. The RBS report states that it identifies the applicable program procedures and controlling documentation and describes the program elements required to support the RBS license renewal application. For the "acceptance criteria" program element, RBS-EP-15-00007 Section 4.5 states that the External Surfaces Monitoring program uses the guidance described in EN-DC-178, "System Walkdowns." EN-DC-178, Attachment 9.4, includes "paint and preservation inadequate," "evidence of corrosion," and "coatings not intact" as examples of typical indications of age-related degradation. EN-DC-178 states that deficiencies identified during a walkdown should be documented (on walkdown sheets, or on Attachment 9.3, "Resolution of Walkdown Inspection Findings") and resolved in the appropriate manner.

Issue

During its on-site audit, the staff noted that the external surfaces of the service water piping in several of the underground connecting tunnels showed varying degrees of coating degradation resulting in broad evidence of corrosion. In addition, during its review of operating experience, the staff identified CR-RBS-2014-03643 and CR-RBS-2016-02355 that address general coating degradation and corrosion of service water piping in these tunnels. Based on the walkdown observation, it is not clear to the staff whether existing periodic system walkdowns prescribed by EN-DC-178 identified and documented any corresponding results. It is also not clear to the staff whether there are any pending issue resolution activities, as described in EN-DC-178, Attachment 9.3 associated with the ongoing corrosion of the service water piping.

Request

Provide additional information to show that existing activities for the External Surfaces Monitoring program, as prescribed by EN-DC-178, identified and documented inadequate paint / preservation, evidence of corrosion, or degraded coatings for service water piping in the underground connecting tunnels. Include a discussion of any pending issue resolution

activities, as described in EN-DC-178, associated with the ongoing corrosion of the service water piping.

RAI B.1.21-1 (Flow-Accelerated Corrosion)

Background

In support of its integrated plant assessment, River Bend Station (RBS) prepared report RBS-EP-15-00007, Revision 0, "Aging Management Program Evaluation Results – Non-Class 1 Mechanical," to demonstrate that the programs credited in the license renewal aging management review reports are adequate to support license renewal. The RBS report states that it identifies the applicable program procedures and controlling documentation and describes the program elements required to support the RBS license renewal application. For the "scope of program" program element, RBS-EP-15-00007 Section 4.8, "Flow-Accelerated Corrosion," states that the program uses the guidance described in EPRI NSAC-202L, Revision 4, "Recommendations for an Effective Flow-Accelerated Corrosion Program," and cites program procedures SEP-FAC-RBS-001, "Flow-Accelerated Corrosion," and EN-DC-315, "Flow-Accelerated Corrosion Program." In addition, RBS-EP-15-00007 states that, for this aspect, the Flow-Accelerated Corrosion program is consistent with GALL Report AMP XI.M17, "Flow-Accelerated Corrosion."

Issue

RBS-EP-15-00007 states that the program uses the guidance from NSAC-202L, Revision 4; however, implementing procedures SEP-FAC-RBS-001, and EN-DC-315 state that the program uses guidance from NSAC-202L, Revision 3. In addition, GALL Report AMP XI.M17 states that the program uses the guidance in NSAC-202L, Revision 2 or Revision 3. Consequently, it is unclear to the staff whether the program will use guidance in Revision 4 of NSAC-202L, as stated in RBS-EP-15-00007, or whether the program will use the guidance in Revision 3 of NSAC-202L, as stated in the associated implementing procedures SEP-FAC-RBS-001 and EN-DC-315, and in GALL Report AMP XI.M17.

Request

Clarify which revision of NSAC-202L is used for guidance in the RBS Flow-Accelerated Corrosion program. If inconsistencies are identified between the applicable revision of NSAC-202L referenced in the integrated plant assessment and the program's implementing procedures or the GALL Report AMP XI.M17, address how these inconsistencies will be resolved.

RAI B.1.21-2 (Flow-Accelerated Corrosion)

Background

For the "detection of aging effects" program element, Section 4.8 of RBS-EP-15-00007 cites procedure EN-DC-315, "Flow-Accelerated Corrosion [FAC] Program," as the basis for being consistent with the GALL Report AMP XI.M17. Procedure EN-DC-315 states that specific

software programs (i.e., “CHECWORKS” and “FAC Manager Web Edition”) shall be used in determining the remaining component life. Based on discussions during the AMP Audit breakout session, both software programs are classified as Level C, which does not require verification/validation activities. GALL Report AMP XI.M17 states that the FAC program is described in NSAC-202L and that components are suitable for continued service if the predicted wall thickness at the next scheduled inspection is greater than or equal to the minimum allowable wall thickness. NSAC-202L, Section 2, “Elements of an Effective FAC Program,” provides recommendations for ensuring that appropriate quality assurance is applied, including properly documenting work. Entergy report EC-0000072133, “RF-19 Post-Outage Report,” includes a signed output sheet from FAC Manager, which contains wall thickness data and the measured wear rate from each inspection.

Issue

For safety-related components, it is not clear to the staff that the remaining component life is being properly determined because the wear rate values are taken from Level C software (i.e., “CHECWORKS” and “FAC Manager Web Edition”), which does not require validation and verification activities. Although the FAC Manager output sheets are signed as prepared and verified, the determination of the wear rate values cannot be independently verified based on the information provided.

Request

Provide additional information to show that appropriate quality assurance has been applied to the calculated wear rates used in the determination of the schedule for inspection of safety-related components.

RAI B.1.21-3 (Flow-Accelerated Corrosion)

Background

For the “detection of aging effects” program element, Section 4.8 of RBS-EP-15-00007 cites procedure EN-DC-315, “Flow-Accelerated Corrosion [FAC] Program,” as the basis for being consistent with the GALL Report AMP XI.M17. For FAC component FWSEP17B030P1-CC#6, Entergy report EC-0000072133, “RF-19 Post-Outage Report,” includes a note indicating that the inspection was due to a leaking system valve. The associated FAC Manager report also states that the nominal thickness of the 20-inch pipe is 1.969 inches, with the measured wear of 0.256 inches and a calculated wear rate of 10.555 mils per year. The staff notes that the calculated wear rate appears to be based on the overall service life of the component, approximately 24 years.

Issue

The calculated wear rate is based on the assumption that the wear took place over a significant portion of the life of the component. However, there is a possibility that the leaking valve caused a much higher wear rate, potentially underestimating the likelihood of the component failure given another occurrence of the leaking valve in the future. Although the program appears to appropriately inspect components downstream of leaking valves, using the

calculated wear rate based on the current methodology potentially causes non-conservative information to be used for evaluating the probability of a future component failure with the leaking valve. It is not clear to the staff how the program addresses the potential for higher than calculated wear rates for "abnormal" yet likely occurrences of leaking valves in the future.

Request

Provide additional information to show how the program considers the potential for higher than currently calculated wear rates for "abnormal" yet likely occurrences of leaking valves in the future.

RAI B.1.39-2 (Selective Leaching)

Background

LRA Sections A.1.39 and B.1.39 state that "[f]or buried components with coatings, no selective leaching inspections are necessary where coating degradation has not been identified."

The "detection of aging effects" program element of GALL Report AMP XI.M33, "Selective Leaching," as modified by LR-ISG-2015-01, "Changes to Buried and Underground Piping and Tank Recommendations," states that "[n]o selective leaching inspections are required of the external surface of buried components which are coated in accordance with Table XI.M41-1 of AMP XI.M41, and where visual examinations of in-scope buried piping has not revealed any coating damage."

Issue

During the audit, the staff reviewed plant-specific documents and concluded that it is unclear whether in-scope buried gray cast iron components are coated. The recommendation to not perform selective leaching inspections of buried components is based on the external coating being in accordance with Table XI.M41-1 of AMP XI.M41 as noted in the Background section above.

Request

1. State what type and whether coatings were specified to be applied to all in-scope gray cast iron buried components. If the types of coatings are not consistent with the recommended coating types in AMP XI.M41, state the basis for their effectiveness at preventing loss of material due to selective leaching.
2. If coatings were not specified to be applied to all in-scope gray cast iron buried components, state the changes to the "detection of aging effects" program element necessary to address selective leaching inspections of the external surfaces of buried components where coatings were not specified to be applied.

RAI B.1.40-1 (Service Water Integrity)

Background

In support of its integrated plant assessment, River Bend Station (RBS) report RBS-EP-15-00007, Revision 0, "Aging Management Program Evaluation Results – Non-Class 1 Mechanical," to demonstrate that the programs credited in the license renewal aging

management review reports are adequate to support license renewal. The RBS report states that it identifies the applicable program procedures and controlling documentation and describes the program elements required to support the RBS license renewal application. For the "scope of program" program element, RBS-EP-15-00007 Section 4.11, "Service Water Integrity," states that there is no piping in the scope of its Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment," response; therefore, no piping is in the scope of the Service Water Integrity program. LRA Table 3.3.2-3, "Service Water System," indicates that the aging effects for piping exposed internally to raw water will be managed by the Internal Surfaces in Miscellaneous Piping and Ducting Components and Flow-Accelerated Corrosion programs.

GL 89-13 Action item III addresses establishing a routine inspection and maintenance program for service water system piping and components to ensure corrosion, erosion, and other problems cannot degrade the performance of the service water system. The RBS updated response to GL 89-13 (dated December 31, 1990) for Action Item III states that the site has established a routine inspection and maintenance program for service water piping and components to ensure that corrosion, erosion, protective coating failure, silting, and biofouling will not degrade the performance of the service water system.

Plant-specific condition report, CR-RBS-2010-06697 states that inaccessible piping submerged in the standby service water basin has not been inspected since initial installation and because it was inaccessible, the GL 89-13 recommendation for Action Item III was not recognized as being applicable to this piping.

Issue

The staff notes that GL 89-13 distinguishes between open-cycle and closed-cycle systems and states that a system is to be considered an open-cycle system, with regard to the specific actions required by the GL, if the system rejects heat directly to a heat sink. The staff notes that although portions of the service water system have been converted to a closed-cooling water system, there are some portions of the system containing raw water that reject heat directly to a heat sink and would be classified as an open-cycle system according to the GL. The staff further notes that although RBS provided additional responses to GL 89-13, these subsequent responses addressed Action Item II and did not address the previously provided activities for GL 89-13 Action Item III. In addition, based on CR-RBS-2010-06697, after recognizing that submerged piping in the standby service water basin is within the scope of GL 89-13 Action Item III, RBS began to perform inspections of the piping as part of the GL 89-13 program.

The staff notes that although loss of material due to corrosion for piping exposed to raw water may be managed by RBS' Internal Surfaces in Miscellaneous Piping and Ducting Components program, the corresponding GALL Report AMP XI.M38 excludes piping and components that are within the scope of the open-cycle cooling water system. The staff also notes that the LRA identifies the Internal Surfaces in Miscellaneous Piping and Ducting Components program as a new program (i.e., is not an existing program) that will be implemented prior to 2025.

Based on the RBS responses to GL 89-13 Action Item III, it is unclear to the staff why the piping exposed to raw water in the service water system is not within the scope of the Service Water Integrity program, as stated in Section 4.11 of RBS-EP-15-00007.

Request

Provide information to clarify whether piping exposed to raw water in the open-cycle cooling water system (as defined by GL 89-13) is excluded from the RBS GL 89-13 responses, such that there is no piping within the scope of the Service Water Integrity program.

RAI B.1.40-2 (Service Water Integrity)

Background

For the "preventive actions" program element, Section 4.11 of RBS-EP-15-00007 states that corrosion products are insignificant due to the water treatment for the normal service water system; therefore, periodic flushing was not identified as part of RBS' response to GL 89-13 and is not performed by the Service Water Integrity program. RBS' initial response, dated February 2, 1990, for GL 89-13 Action Item I discusses the need to verify flow in portions of infrequently used cooling loops in the service water system.

Several plant-specific condition reports (e.g., CR-RBS-2008-03885, CR-RBS-2011-03700, CR-RBS-2011-08119, CR-RBS-2012-01217, CR-RBS-2014-05562, and CR-RBS-2017-01659) document high differential pressures across the normal service water inlet strainers to the service water cooling heat exchangers. CR-RBS-2012-01217 states that the preventive maintenance frequency to clean the strainers needs to be updated to prevent excessive clogging and that the debris found in the strainer appears to be mostly rust particles.

Issue

Based on the plant-specific condition reports over several years, periodic high differential pressures across strainers, with the debris in some instances consisting mostly of rust particles, indicates that more than a minimal amount of corrosion products exist in the system. In addition, the existence of a preventive maintenance activity to clean the strainer indicates that some level of fouling is ongoing in the system. It is not clear to the staff that corrosion products are insignificant due to the water treatment in the normal service water system. Consequently, flushing of infrequently used cooling loops may be warranted.

Request

Provide additional information to support the current Service Water Integrity program's lack of preventive actions, such as periodic flushing, based on the plant-specific condition reports over several years with high differential pressures across strainers in the system.

RAI B.1.40-3 (Service Water Integrity)

Background

With regard to the "parameters monitored or inspected" program element, LRA Table 3.3.2-3, "Service Water System," lists the standby cooling tower spray nozzles with an intended function only as pressure boundary; the aging effect requiring management only as loss of material; and the aging management program as Internal Surfaces in Miscellaneous Piping and Ducting Components. LRA Table 2.0-1 "Component Intended Functions: Abbreviations and Definitions," describes "flow control" as providing control of flow rate or establishing a pattern of spray, and "flow distribution" as providing distribution of flow. The service water system design criteria states that the returning service water is sprayed and cooled in the standby service

water cooling tower. The LRA identifies the Internal Surfaces in Miscellaneous Piping and Ducting Components program as a new program (i.e., is not an existing program) and states that the program will be implemented prior to 2025.

Issue

Based on statements in the service water system design criteria (i.e., that the returning service water is sprayed and cooled in the standby service water cooling tower), the spray nozzles appear to have an intended function of either flow control or flow distribution. In response to questions during the program audit, RBS personnel stated that the nozzles have a large diameter opening to distribute the water over the fill [emphasis added]. As a result, it is unclear to the staff whether all intended functions of the spray nozzles have been identified. In addition, it is unclear to the staff whether aging affects requiring management of the spray nozzles should also include flow blockage due to fouling for the raw water environment. It is also unclear to the staff whether the spray nozzles, which are part of the system that directly rejects heat to a heat sink, are within the scope of GL 89-13 and consequently within the scope of the Service Water Integrity program.

Request

For the standby cooling tower spray nozzles, provide additional information to clarify:

1. whether all intended functions of the spray nozzles have been identified,
2. whether aging affects requiring management also include flow blockage due to fouling for the raw water environment, and
3. whether spray nozzles are within the scope of GL 89-13 and consequently within the scope of the Service Water Integrity program.

RAI B.1.40-4 (Service Water Integrity)

Background

For the "detection of aging effects" program element, Section 4.11 of RBS-EP-15-00007 states that nondestructive testing is periodically used to measure the extent of wall thinning associated with service water integrity components. Based on drawing 0232.530-087-007, Revision 300, "Piping Isometric," large portions of the horizontal carbon steel distribution piping for the standby service water cooling tower have standing water with an air-to-water interface. Based on industry operating experience in NRC Information Notice 2013-06, "Corrosion in Fire Protection Piping Due to Air and Water Interaction," this can lead to increased corrosion due to ~~differential~~ aeration at the air-to-water interface and corrosion product accumulation.

Issue

Based on the potential for increased corrosion and corrosion product accumulation, it is not clear to the staff whether augmented inspections should be considered to ensure loss of material and flow blockage due to fouling are being adequately managed in portions of the service water distribution piping in the standby cooling tower.

Request

Provide additional information to show that program activities will adequately manage aging of the horizontal carbon steel piping in the standby service water cooling tower resulting from the increased potential for corrosion and corrosion product accumulation due to the air-to-water interface.

RAI B.1.40-5 (Service Water Integrity)

Background

LRA Table 3.5.2-2, "Water-Control Structures," indicates that the cooling tower tile fill for both the standby service water and the service water cooling systems do not have aging affects requiring management and, consequently, do not need an aging management program. Plant-specific condition report CR-RBS-2008-05043 discusses broken pieces of cooling tower fill material in the collector pots of the circulating water system. During the aging management program audit, RBS personnel stated that the circulating water system cooling tower fill is similar to the standby service water fill material in LRA Table 3.5.2-2. In addition, CR-RBS-2006-03376 discusses the failure of the fill material support members in the service water cooling system cooling tower Cell D that resulted in approximately 30 percent of the fill material falling into the associated cooling tower basin. According to the condition report, a contributing factor of the failure was an overload condition caused by fouling of the fill material. Several corrective actions from this condition report included the development of a periodic fill inspection program.

Issue

Based on plant-specific condition reports CR-RBS-2006-03376 and CR-RBS-2008-05043, documenting degradation of the fill material (either cracking or fouling that leads to an increase in weight), it is not clear to the staff why there are no aging effects requiring management for the fill material in the cooling towers for the standby service water and service water cooling systems.

Request

Given the plant-specific condition reports described in CR-RBS-2006-03376 and CR-RBS-2008-05043, associated with the fill material in the cooling towers, state the basis for why there are no applicable aging effects. Alternatively, state how the LRA will be revised to address the applicable aging effects.

RAI B.1.43-1 (Closed Treated Water Systems)

Background

In support of its integrated plant assessment, River Bend Station (RBS) prepared report RBS-EP-15-00007, Revision 0, "Aging Management Program Evaluation Results – Non-Class 1 Mechanical," to demonstrate that the programs credited in the license renewal aging management review reports are adequate to support license renewal. The RBS report states that it identifies the applicable program procedures and controlling documentation and describes the program elements required to support the RBS license renewal application. For the "parameters monitored or inspected" program element, RBS-EP-15-00007 Section 4.13, "Water Chemistry Control – Closed Treated Water Systems," states that the chemical parameter limits and action levels are stated in the "River Bend Station Closed Cooling Water Systems Strategic Plan" and that the program's established standards are consistent with EPRI 1007820, "Closed Cooling Water Chemistry Guideline." The report also states this program element is consistent

with the GALL Report AMP XI.M21A. The corresponding portion of the GALL Report AMP XI.M21A states that EPRI 1007820 is used for closed-cycle cooling water systems defined in NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," and that in all cases the selected industry standard is used in its entirety.

Issue

The "River Bend Station Closed Cooling Water Systems Strategic Plan" includes Appendix 1, "Justification for the Deviations from EPRI CCW Guidance," which documents inconsistencies with EPRI 1007820 for various parameters in seven systems. In addition, in the strategic plan table for "Diesel Jacket Water System Surveillance and Monitoring," the values of the C1 and C2 action levels for pH are inconsistent with the corresponding values in EPRI 1007828, and these deviations are not addressed in the Appendix 1 discussions. It is unclear to the staff that the Water Chemistry Control – Closed Treated Water Systems program was consistent with the "parameters monitored or inspected" program element of the GALL Report AMP XI.M21A.

Request

Based on the apparent inconsistencies discussed above, provide additional information to show that the Water Chemistry Control – Closed Treated Water Systems program is consistent with the "parameters monitored or inspected" program element of the GALL Report AMP XI.M21A.

RAI B.1.43-2 (Closed Treated Water Systems)

Background

For the "detection of aging effects" program element, Section 4.13 of RBS-EP-15-00007 states that the Water Chemistry – Closed Treated Water Systems program manages the effects of aging in an environment of treated water. For the vacuum release accumulators in LRA Table 3.3.2-3 (TK1A and TK1B on drawing PID-09-10F), the internal environment is listed as treated water with the aging management program listed as Water Chemistry Control – Closed Treated Water Systems.

Issue

Based on the information shown on drawing PID-09-10F, "System 118 Service Water Normal," the accumulators and portions of the associated piping do not appear to have an internal environment of treated water because these components are supplied by the compressed air system. It is not clear to the staff whether these components have a treated water internal environment and whether the aging affects for these components will be managed by the Water Chemistry Control – Closed Treated Water Systems program as listed in LRA Table 3.3.2-3.

In addition, based on information in Standby Service Water Quarterly Valve Operability Test procedures (STP-256-6305 and STP-256-6306 for valves SOV-522A, B, C, D and SOV-523A, B, C, D), air is periodically introduced into portions of the piping as part of the vacuum release solenoid valve function verification. Based on the piping configurations in various isometric drawings, it appears that air cannot be vented in some portions of the associated piping, between the check valves and the treated water source. Consequently, there will be an

air-water interface in a portion of the pipe, with the air being periodically replenished, similar to the situation in NRC Information Notice 2013-06, “Corrosion in Fire Protection Piping Due to Air and Water Interaction.” It is not clear to the staff that the Water Chemistry Control – Closed Treated Water Systems program activities account for this situation.

Request

1. Clarify the information provided in LRA Table 3.3.2-3 with regard to the internal environment of the vacuum release accumulators and portions of the associated piping, and whether aging effects of these components will be managed by the Water Chemistry Control – Closed Treated Water Systems program.
2. Provide additional information to show that the activities in the Water Chemistry Control – Closed Treated Water Systems adequately account for the potential air-water interface in the portions of the piping that cannot be vented between the check valves and the treated water source (associated with SOV-522A, B, C, D, and SOV-523A, B, C, D).

ATTACHMENT 1 Summary of RAIs Set 9 Sent to Entergy Operations Inc.

No.	TRP#	RAI#	RAI Issue	Date Sent to Entergy	Date of Clarification Call	Modified After the Clarification Call
1	37	B.17-1	External Surfaces Monitoring	01/16/18	01/24/18	Yes
2	37	B.17-2	External Surfaces Monitoring	01/16/18	01/24/18	No
3	37	B.17-3	External Surfaces Monitoring	01/16/18	01/24/18	Yes
4	18	B.1.21-1	Flow-Accelerated Corrosion	01/16/18	01/24/18	Yes
5	18	B.1.21-2	Flow-Accelerated Corrosion	01/16/18	01/24/18	Yes
6	18	B.1.21-3	Flow-Accelerated Corrosion	01/16/18	01/24/18	Yes
7	34	B.1.39-2	Selective Leaching	01/16/18	01/24/18	No
8	21	B.1.40-1	Service Water Integrity	01/19/18	01/24/18	Yes
9	21	B.1.40-2	Service Water Integrity	01/19/18	01/24/18	Yes
10	21	B.1.40-3	Service Water Integrity	01/19/18	01/24/18	No
11	21	B.1.40-4	Service Water Integrity	01/19/18	01/24/18	Yes
12	21	B.1.40-5	Service Water Integrity	01/19/18	01/24/18	Yes
13	22	B.1.43-1	Closed Treated Water Systems	01/19/18	01/24/18	Yes
14	22	B.1.43-2	Closed Treated Water Systems	01/19/18	01/24/18	Yes